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**A LOOK AT THE ORAL HEALTH GUIDANCE SKILLS OF PUBLIC HEALTH  
NURSES WORKING WITH ASTHMA PATIENTS**

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NURSES WORKING WITH ASTHMA PATIENTS**

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## ABSTRACT

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Asthma as a chronic or long-term disease does not directly affect oral health, but the treatments administered in the care of asthma patients, namely inhalable corticosteroids, do have a noticeable effect on oral health, especially with prolonged use. These side effects may lead to increased risk for a range of oral health conditions, which makes it important for public health nurses to have relevant, correct information on oral health care and minimizing the side effects of the drugs when working with asthma patients.

The objective of this study was to present a picture on the oral health guidance skills of public health nurses working with asthma patients, as well as show what kind of instruction public health nurses provide to their asthma patients on oral health related issues.

The study was qualitative and the data were collected via semi-structured interview. The tape record technique was used to collect data from the interviewees and content analysis was used to process collected data.

According to the study, public health nurses provide guidance on the principles of asthma medication and its effect on general health of asthma patients. Nurses rated their knowledge about side-effects of asthma medication on oral health of asthmatics and their guidance skills in this area as basic. Nurses would require additional courses on the influence of drugs/medication on oral health and its relation to dental hygiene in general, as well as multi professional cooperation with dental health care professionals.

The study has revealed that public health nurses are experienced professionals while dealing with general aspects of asthma, but their knowledge and skills about oral health care related topics needs to be supplemented and augmented.

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Keywords: public health nurse, asthma, asthma patient, oral health, guidance

# TIIVISTELMÄ

Oulun ammattikorkeakoulu  
Suun terveydenhuollon koulutusohjelma

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Tekijä: Veronika Fedorik

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Krooninen tai pitkäaikainen astma ei vaikuta suoraan suun terveyteen. Astman hoidossa käytettävillä lääkkeillä, kuten hengitettävillä kortikosteroideilla, on kuitenkin huomattava vaikutus suun terveyteen, erityisesti pitkäaikaisessa käytössä. Nämä sivuvaikutukset saattavat pahentaa suun terveyden tilaa. Sen takia on tärkeää, että terveydenhoitajilla, jotka työskentelevät astmapotilaiden kanssa, on ajanmukaista tietoa suun terveydestä ja astmalääkkeiden sivuvaikutuksista.

Tutkimuksen tarkoituksena on kuvata, kuinka astmapotilaiden kanssa työskentelevät terveydenhoitajat osaavat ohjata potilasta suun terveydenhoitoon liittyvissä asioissa. Tarkoituksena on myös selvittää, mitä ja kuinka paljon terveydenhoitajat tietävät astmalääkkeiden vaikutuksista suun terveyteen.

Tutkimus on kvalitatiivinen. Aineiston kerättiin teemahaastatteluilla ja kaikki haastattelut nauhoitettiin. Analyysimenetelmänä käytettiin sisällön analyysia.

Tutkimus osoittaa, että terveydenhoitajat osaavat ohjata hyvin astmalääkityksen liittyvissä perusasioissa sekä siinä, miten lääkkeet vaikuttavat astmapotilaiden yleisterveyteen. Hoitajat arvioivat, että heidän tietämyksensä astmalääkkeiden vaikutuksesta suun terveyteen ja heidän kykynsä ohjata astmapotilaita tässä asiassa on hieman puutteellista. Hoitajat toivovat sekä lääkkeiden sivuvaikutuksiin ja suuhygienian liittyvää lisäkoulutusta että enemmän yhteistyötä suun terveydenhoidon ammattilaisten kanssa.

Tutkimuksen mukaan terveydenhoitajilla on hyvin kokemusta astman hoidosta yleisesti, mutta heidän osaamisensa suun terveyteen liittyvissä asioissa kaipaava täydennystä ja kehitystä.

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Asiasanat: terveydenhoitaja, astma, astmapotilas, suun terveys, ohjaus

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## INTRODUCTION

In this thesis I take a look at the skill level of public health nurses in Finland in specific relation to working with and guiding asthmatic patients on oral health care. In the Finnish health care system, a qualified doctor will perform the initial assessment and diagnosis to determine if a patient has asthma. However, once this initial assessment is established, it is most often public health nurses, rather than doctors or dentists, that will carry out general guidance on oral health and other health issues with the patient.

Whereas asthma in and of itself as a medical condition does not affect the state of the oral cavity, several of the drugs prescribed to asthma patients, in particular inhalable corticosteroids, do. With utilization of medication containing corticosteroids, if oral hygiene is not properly addressed, a variety of medical conditions in the mouth and throat areas can result. Often, if the drug is not properly administered, or if the patient does not correctly rinse and clean the oral cavity after taking medication, conditions such as hoarseness, dental candidiasis, periodontal disease, caries and dental erosion.

For this reason, it is very important that public health nurses, who are many times the first and only point of contact for asthma patients after their initial diagnosis and assessment, to understand the potential problems that can be caused with continued usage of inhalable corticosteroids, and to be able to provide accurate and sufficient guidance on oral health care to these asthma patients. Public health nurses should have sufficient and up-to-date professional skills when working with asthmatic patients in order to be able to provide relevant and helpful information.

In this study, it is my goal to determine, through qualitative research methods, the extent and level of knowledge regarding the relation between asthma drugs and oral health possessed by public health nurses in Finland. The research aims, by means of interview, to determine how public health nurses working with asthmatic patients approach the issue of oral health guidance, what kind of information they usually provide to their patients, and also if and whether the nurses actually have sufficient skills in this area. This research also approaches the issue of what can be done to improve the professional

skills of public health nurses when providing oral health care guidance to asthmatic patients.



# **1 A BACKGROUND ON ASTHMA AS A CONDITION**

Asthma is one of the commonest public health problems in Finland. According to the asthma program in Finland (1994-2004) it is the third most common chronic (long-lasting) disorder right after hypertension and coronary heart disease.

It is not possible to manage asthma without medical treatment. For this reason two main groups of medication are used: controllers and relievers. Inhalable controllers, in particular, usually cause side-effects in the oral cavity. That is why it is important to give asthma patients correct and relevant information about how to care about their oral health and how to minimize and reduce the side-effects of the inhaled drugs. In primary care the general practitioner (GP) and public health nurse usually work as the contact person for asthma patients. (Thomas, Parolia, Kundabala & Vikram 2010, 128.)

Asthma is a chronic (long-term) disease affecting both children and adults. It is usually diagnosed during childhood, but can develop and manifest at any stage in life, including adulthood. Asthma is considered to be a serious public health problem throughout the world and affects all age groups. Asthma is a chronic inflammatory disease of the airways. This disorder is defined by its clinical, physiological and pathological characteristics. (Global Initiative for Asthma –GINA 2012, 2, cited 22.1.2014.)

The inflammation of airways causes bronchial constriction and also hypersensitivity of the bronchus (mucous membrane) to different stimuli (Harju, Keinänen & Kinnula 2000, 2). The sensitivity can be caused by a variety of factors: another allergy, a microbe or some unknown long-lasting stimulus (Virtanen 2007, 3). Asthma narrows and inflames the airways. Typical symptoms include a whistling sound while breathing, feelings of tightness in the chest, shortness of breath and coughing. (National Heart, Lung and Blood Institute 2012, cited 28.1.2014.)

## **1.1 Incidence and Prevalence of Asthma Worldwide and in Finland**

Due to a lack of a single diagnostic test, seldom used objective lung function tests and also differences in patients' interpretations of their symptoms, it is difficult to determine the true incidence of asthma (Tuomisto 2010, 16). Asthma is one of the major non-communicable diseases in the world. According to WHO (2013, Fact Sheet N°307, cited 4.2.2014), some 235 million people currently suffer from asthma. GINA (2012, cited 22.1.2014) states that asthma affects an estimated 300 million individuals globally.

In most European countries the incidence of asthma has increased during the years 1950- 2000. It now appears that the prevalence of asthma in western Europe will be leveling off, for example in countries like the UK and Ireland which have some of the highest rates of asthma in the world. In the whole of Europe, about 30 million children and adults under 45 years of age have asthma. (European Respiratory Society 2014, European Lung White Book, Chapter 12, cited 30.1.2014.)

The survey Terveys 2000 describes that 7% of men and 4% of women over 30 years of age suffer from asthma. In addition to this there is approximately 5% of population who already suffer from similar symptoms. (Haahtela 2003, 67.) Generally speaking, around 10% of the Finnish population suffers from asthma. A huge number of asthma patients also suffer from various allergies, which cause them even more breathing problems. (Allergia- ja astmaliitto 2014, cited 24.1.2014.)

According to National Institute for Health and Welfare, the depression and asthma situation has not changed. Survey Terveys 2011 showed that 8% of men and 12% of women in Finland suffer from asthma. It means that the incidence of asthma is almost on the same level as in year 2001. (Koskinen, Lundquist & Ristiluoma 2011, 89, cited 21.1.2014.)

In 2011, 238 716 patients were considered as being entitled to special compensation (medical insurance reimbursement) for asthma. The asthma was the second most common disease in Finland right after hypertension, which belongs to the special compensation category. In the same year new special compensation rights were passed to 14818 people. (Käypä hoito- suositus 2012, Astma, cited 22.1.2014.)

## **1.2 Causes, Diagnosis and Treatment of Asthma**

Asthma is an inflammatory disease affecting airways. The mucous membrane inflammation is usually caused by its overreaction to some allergen or microorganism. Long-lasting asthma inflammation causes irritation of the bronchial airways in the lungs to various stimuli, which leads to episodic breathing problems. Bronchial obstruction usually varies. When the disease lasts for long, there are permanent structural changes on bronchus visible, as for example connective tissue proliferation in the mucous membrane or in the surrounding muscle layer of the bronchial tubes. (Haahtela 2013, 4, cited 23.1.2014.)

### **1.2.1 Asthma Risk Factors and Triggers**

The exact cause of asthma is not known. Asthma is considered to be a multicausal disease and it is caused by combination and interaction of the host factor with environmental factors (triggers). The influence of risk factors in the onset of asthma can vary greatly among individuals. In some people the development of asthma is caused by a genome (host factor), whereas in others the cause is an environmental factor. (Laitinen, Juntunen-Backman, Hedman & Ojaniemi 2000, 18.)

One of the host factors is genetic. Asthma has a heritable component, but current data shows that multiple genes may be involved in the pathogenesis of asthma and different genes may be involved in different ethnic groups. (GINA 2012, 4, cited 22.1.2014.) If there is one asthmatic parent in the family, there is a 2-3times higher risk for their children to suffer from asthma in the future, in comparison to a family in where none of the parents has asthma. (Laitinen, et al. 2000, 18.)

Another risk factor is obesity. Asthma is more frequently observed in people with BMI > 30 kg/m<sup>2</sup>. Obesity can worsen asthma symptoms and make them more difficult to manage. It has been proven that obese people with asthma have lower lung functionality. It is still uncertain how obesity can lead to the development of asthma, but we can tell for sure that obese patients have a reduced expiratory reserve volume. That is why obesity can make asthma more difficult to control and is associated with a reduced beneficial effect provided by asthma medications. (GINA 2012, 5, cited 22.1.2014.)

A person's sex is also considered to be an important asthma trigger. During childhood, males are at a higher inherent risk of suffering from asthma than females. As children mature, the difference in inherent risk between the sexes narrows, as can be seen during teenage, when the difference is quite small. On the other hand, during adulthood the incidence of asthma is higher in females than in males. (Laitinen, et al. 2000, 18.) The reasons for sex-related differences are not clear. But, for example, lung size is smaller in males than in females after birth but larger in adulthood. (GINA 2012, 5, cited 22.1.2014.) The hormonal factor may also play a role in the higher incidence of asthma in females as opposed to males (Laitinen, et al. 2000, 18).

Among the environmental factors, allergens as an asthma risk factor are easily determined because indoor and outdoor allergens are well known. However, the problem is that we still do not know what the specific role of allergens in asthma development is. (GINA 2012, 5, cited 22.1.2014.)

Infection as a risk factor is linked to influenza or cold and can trigger an asthma attack (Centers for Disease Control and Prevention- CDC 2013, cited 20.1.2014). For example the-influenza virus can cause certain symptoms including bronchiolitis, which are a feature of childhood asthma (GINA 2012, 5, cited 22.1.2014).

Tobacco smoke is unhealthy not just for people with asthma but for the whole environment. It is recommended to quit smoking when a patient suffers from asthma, or for ex-ample when there is an asthmatic child in the family. (CDC 2013, cited 20.1.2014.) Smoking in females has increased over the past years. It has been proved that a mother smoking during pregnancy can lead to asthma in the child. It has also been shown that a few years of periodic smoking may increase the risk of asthma incidence in adolescents. (Laitinen, et al. 2000, 18.)

Indoor and outdoor pollution can also have quite a big effect on asthma. Outdoor air pollution comes from automobiles, factories and other sources. People suffering from asthma should find and pay attention to a quality weather forecast, and plan their activities accordingly. (CDC 2013, cited 20.1.2014.) Examples of indoor pollution include pets, mould inside houses, etc.

The correlation between a person's diet and asthma increase is not clear. Sufficient breast-feeding (a minimum of 4 months) can protect the infant from asthma development. In some surveys it is shown that rich consumption of salt and lack of vitamin C and magnesium can increase the risk of asthma in patients. Lack of fish and fresh vegetable in the diet may also lead to increased risk of asthma. (Laitinen, et al. 2000, 19.)

### **1.2.2 Asthma Symptoms and Asthma Attacks**

Symptoms vary from person to person, and may also change over time. The first and most significant symptom of asthma is usually long lasting coughing, which appears usually during night hours (Haahtela 2003, 67) . Because the root factor is the narrowing of the airways, the next significant symptoms after long-lasting coughing tend to be shortness of breath, wheezing and chest tightness (Asthma Australia 2014, cited 15.1.2014).

Sometimes asthma symptoms can get worse very rapidly. This can be caused by the tightening of muscles around the airways (a condition referred to as bronchospasm). Following this, an asthma attack usually develops. The attack can be caused by some allergen, wrong asthma treatment or infection. The symptoms of asthma attack include the major symptoms described above, as well as difficulty performing normal day-to-day activities, severe wheezing when breathing both in and out, coughing that won't stop, very rapid breathing, chest pain or pressure, tightened neck and chest muscles, blue lips or fingernails and feelings of anxiety or panic, etc. (Laitinen, et al. 2000, 121.)

### **1.2.3 Diagnosis and Treatment of Asthma**

Diseases generally influence and change the lives of the patients and their families. Asthma may seem frightening and cause anxiety. For example, younger patients often deny their own illness, which may then result in irregular intake of medicine, psychological symptoms, unhealthy life habits (smoking, etc.) and other risk behavior. If treatment is to be successful, it is important that the patient is aware of and understands the causes of asthma, as well as the possibilities and expected results of treatment. A substantial part of successful treatment is creating and maintaining a good

relationship between patient and health provider, total individual care and adequate guidance. (Asthma Program in Finland 1994, 33, cited 24.1.2014.)

The successful and effective management of asthma (as for all chronic diseases) begins with making an accurate and timely diagnosis (Tuomisto 2010, 18). With early diagnosis and medication to treat inflammation of the mucosa, it is possible to improve the prognosis of asthma in both adults and children. Careful clinical examination and accurate anamnesis information are fundamental in diagnosis. (Asthma Program in Finland 1994, 33, cited 24.1.2014.)

The diagnosing of asthma usually starts with an examination in primary health care. The general practitioner (GP) will first ask about family history of asthma and allergies. The patient is then questioned if he/she suffers from some typical asthma symptoms. (National Heart, Lung and Blood Institute 2012, cited 28.1.2014.) The following examination will be a physical exam, where the GP listens to a patient's breathing and looks for signs of asthma or allergies. The GP will also check heart function, nasal mucous and skin. (Haahtela 2013, cited 27.1.2014.)

The diagnosis is followed by diagnostic tests. To confirm a diagnosis of asthma, it is sufficient if one of the following six tests is positive. (Käypä hoito- suositus 2012, Astma, cited 22.1.2014.) At first, it will start with spirometry, which is the most frequently used basic diagnostic test in pulmonary medicine. Spirometry seems to influence the GP's decision-making process not only by reducing diagnostic uncertainty, but also by increasing the use of additional diagnostic tests and referral to specialist care. (Tuomisto, Jarvinen, Laitinen, Erhola, Kaila & Brander 2008, 226.) Spirometry is used to provide a measurement of how much air a patient can breathe in and out. It also measures how fast a patient can blow air out after full inspiration, etc. (Laitinen, et al. 2000, 22.) The second important diagnostic test is PEF measurement –a bronchial dilatation test. PEF home measurement is carried out for 2 weeks: one week without medication and one with beta2 sympathomimetic, with measurements carried out morning and night before and after medication. PEF measurement at the clinic can be performed as a third test, before and 15 minutes after inhalation of beta2 sympathomimetic (2-4 inhalations). (Asthma Program in Finland 1994, 34, cited 24.1.2014.) Following this, hyperactivity to histamine or methacholine can be tested.

The final two tests are the cardiac stress test, where the asthma reaction to exercise is checked, and the cortisone test. (Käypä hoito- suositus 2012, Astma, cited 22.1.2014.)

The substantial goal of asthma treatment is elimination of symptoms and recovery (Asthma Program in Finland 1994, 36, cited 24.1.2014). The next most important goals are prevention of chronic and troublesome symptoms such as coughing and shortness of breath, and to reduce the patient's need for quick-relief medicine. In the treatment it is essential to start efficiently to help improve the prognosis. (Käypä hoito- suositus 2012, Astma, cited 22.1.2014.)

Drugs are still the only viable option in the treatment of asthma, and these drugs are generally divided into two basic groups: controllers and relievers (Laitinen, et al. 2000, 29).

- Controllers- Long-Term Control Drugs

Controllers are taken daily to help prevent symptoms of asthma. These drugs reduce airway inflammation, which helps prevent symptoms from starting. The most preferred medicine for long-term control of asthma are inhalable corticosteroids. (Haahtela 2010, cited 25.1.2014.) Examples of corticosteroids commonly utilized in Finland include: beklometasoni, budesonidi, flutikasoni, mometasoni and siklesonidi. If the asthma conditions get worse, it is possible to apply corticosteroids in tablet form. If they are used over a short time there are no serious side effects, but long-term use can cause serious side-effects such as thinning of the skin and an increase in bruises, bone mass loss, increased blood pressure and blood glucose levels. (Paakkari 2013, cited 29.1.2014.)

- Relievers- Quick-Relief Drugs

Relievers are used by asthma patients usually when they need to quickly relax tight muscles around airways when they are having a flare-up (asthma attack). This allows the airways to open up so air can flow through them. Usually beta2 –agonists are utilized as quick-relief drugs. (National Heart, Lung and Blood Institute 2012, cited 28.1.2014.) Examples of commonly used relief drugs in Finland include fenoteroli, formoteroli, salbutamoli, salmeteroli, indakateroli and terbutaliini. These drugs can be further divided into short-lasting, which are used as prevention before stress, and long-

lasting which are used when controller drugs are not enough to manage asthma symptoms. (Paakkari 2013, cited 29.1.2014.)

The following tips are recommended as adjunctive therapy:

- Exercise: as for example walking, cycling, swimming, gymnastics, etc. Regular exercise is important for people suffering from asthma.
- Diet: weight loss can reduce the symptoms and need to rely on drugs. However, there is no recommended special diet for asthmatics.
- Travelling south: warm and mild air ease asthma symptoms, but asthma patients should still remember that the air in a holiday destination also has to be clean.
- Humidity: appropriate air humidity is approximately 30-40%. When the air is too moist it just encourages mould and dust mites' growth.
- Respiratory protective equipment, etc. (Haahtela 2003, 78-79.)



## **2 ASTHMA IN RELATION TO PATIENTS' ORAL HEALTH**

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing. The most common oral diseases are dental cavities, periodontal (gum) disease, oral cancer, oral infectious diseases, trauma from injuries, and hereditary lesions. Public health solutions for oral diseases are most effective when they are integrated with those for other chronic diseases and with national public health programs. (WHO 2012, Fact Sheet N°318, cited 25.1.2014.)

According to estimates, less than half of all adults have an acceptable oral hygiene routine. Figures from the Adult Dental Health Survey 2009 (Fuller, Steele, Watt & Nuttall 2011, 10, cited 28.1.2014) revealed that basic dental products aren't being used as part of an all-round routine. Only three in ten (31%) people use mouthwash and less than one in four (22%) use floss. The same data also showed 42% of adults only use a toothbrush and toothpaste, with more than one in four (27%) saying they use an electric brush. Furthermore, it also showed that less than one in four adults (24%) do not know what level of fluoride their toothpaste should contain. (British Dental Journal 2013, cited 27.1.2014.)

### **2.1 Side-effects of Asthma Drugs on Oral Health**

Asthma as a chronic or long-term disease does not directly affect oral health, but the treatments administered in the care of asthma patients, namely inhalable corticosteroids, do have a noticeable effect on oral health, especially with prolonged use. Several side effects associated with the use of these drugs have been noted: decreased salivary flow rate, increased levels of calcium and phosphorus in saliva, and a decrease in pH levels in the mouth, among others. These side effects may lead to an increased risk in a range of oral health conditions, such as dental caries, dental erosion, periodontal disease and dental candidiasis. (Virtanen 2007, 12-13.)

Asthmatic patients may be at a higher risk of developing dental diseases. Dental practitioners should be aware of the correlation between asthma and oral health. It is important that they educate their patients to follow precautionary measures to prevent adverse effects on oral tissues. (Thomas et al. 2010, 132.)

### **2.1.1 Asthma and Dental Caries**

Dental caries, also known as tooth decay or a cavity, is an infection which is bacterial in origin that causes demineralization and destruction of the hard tissues of the teeth (enamel, dentin and cementum). It is a result of the production of acid by bacterial fermentation of food debris accumulated on the tooth surface. (Lumio 2013, cited 2.2.2014.)

Asthma through its disease status and its pharmacotherapy, includes some risk factors such as a decrease in the salivary flow rate and pH for caries development. The reason for a higher rate of caries observed in people with asthma can often be attributed to the presence of fermentable carbohydrate in asthma medication. Some dry powder inhalers contain sugar so that the patient can handle the taste of the drug when it is delivered. Frequent oral inhalation of such sugar-containing drugs, combined with a decrease in salivary flow rate can make a contribution towards an increased risk of caries. The highest caries prevalence in asthmatics is seen in patients taking some kind of syrup form of medication. Many patients will also show an increased consumption rate of cariogenic drinks. They may do this for many differing reasons, among them the feeling of dryness in the mouth caused by the inhalant, or simply to get rid of the taste of the drug in the mouth. (Thomas et al. 2010, 129.)

### **2.1.2 Asthma and Dental Erosion**

Dental erosion means irreversible loss of tooth structure due to chemical dissolution by acids that are not of bacterial origin. The causes of dental erosion can be internal and external. Internal causes include, for example, vomiting or regurgitation of gastric acids. External causes of dental erosion may include the following: consumption of acidic foods and drinks (with a pH below 5.0 – 5.7) or medications. (Meurman & Murtomaa 2009, cited 4.2.2014.)

Asthma medication can place the patient at a risk of dental erosion by reducing salivary protection against extrinsic or intrinsic acids. Saliva is considered to be one of the main neutralizing factors in arresting the progress of dental erosion. The oral clearance of dietary acid is related to the rate of secretion and buffering capacity of saliva. There can be an increased dryness of the mouth in asthmatics due to the effects of bronchodilators and/or mouth breathing. So it is possible that there will be an increase in the consumption of drinks to compensate for this oral dehydration. Often drinks consumed have a low pH and this may result in dental erosion.

There is evidence that medicine taken in form of a dry powder inhaler may cause tooth erosion by changing the chemical environment of the mouth. The main asthmatic drugs in current use, especially the powdered drugs, have a pH less than the critical level of 5.5 required for hydroxiapatite dissolution.

Another possible explanation for acidic erosion of teeth in people with asthma is that they have an increased incidence of gastro-esophageal reflux. The prevalence of reflux symptoms is higher in patients with asthma than in the control population. (Thomas et al. 2010, 130-131.)

### **2.1.3 Asthma and Periodontal Disease**

Periodontal diseases range from simple gum inflammation to serious disease that results in major damage to the soft tissue and bone that supports the teeth. In the worst cases, teeth are lost. The longer plaque and tartar are on teeth, the more harmful they become. Two main periodontal diseases are gingivitis and periodontitis.

Gingivitis is caused by bacteria which cause inflammation of the gums. The gums become red, swollen and can bleed easily. Gingivitis is a mild form of gum disease that can usually be reversed with daily brushing and flossing, and regular cleaning by a dentist or dental hygienist. This form of gum disease does not include any loss of bone and tissue that hold the teeth in place.

Periodontitis, which simply means inflammation around the tooth, occurs when gingivitis is not treated properly. In periodontitis, gums pull away from the teeth and form spaces (called "pockets") that become infected. The body's immune system fights the bacteria as the plaque spreads and grows below the gum line. Bacterial toxins and the body's natural response to infection start to break down the bone and connective tissue that hold teeth in place. If not treated, the bones, gums, and tissue that support the

teeth are destroyed. The teeth may eventually become loose and have to be removed.(National Institute of Dental and Craniofacial Research 2012, cited 25.1.2014.)

An association between asthma and periodontal disease may involve either pathological activation of the immune and inflammatory process, the side effect of asthma medication or the interaction between the two. As it was mentioned above, interaction between bacterial and immunological factors are found to be the main cause of destruction of periodontal tissue. Saliva impacts this interaction through its protective mechanism. Since many asthma drugs modify salivary secretion in a significant percentage of patients, the periodontal health of the asthma patients may be affected negatively.

Also, systematic bone loss caused by asthma drugs, especially when high doses are used for a long time, may have an impact on the onset and progression of periodontal disease. (Thomas et al. 2010, 131.)

#### **2.1.4 Asthma and Oral Candidiasis**

Oral candidiasis (also known as oral thrush) is a condition in which the fungus *Candida albicans* accumulates on the lining of the patient's mouth. Oral thrush causes creamy white lesions, usually on the tongue or inner cheeks. The lesions can be painful and may bleed slightly when the patient scrapes them. Sometimes oral thrush may spread to the roof of the mouth, gums, tonsils or the back of the throat. (Hiiri 2009, cited 2.2.2014.)

Candidiasis, as side effect of asthma treatment, may be attributed to the topical effects of these medications on the oral mucosa, as only 10 to 20% of the dose from the inhaler actually reaches the lungs, while the rest remains in the oropharyngs.

Generalized immunosuppressive and anti-inflammatory effects of steroids are thought to play a major role in the pathogenesis of candidiasis. Generally patients who are treated with corticosteroids show a higher level of salivary glucose than the control group. Also, many dry powder inhalers contain lactose monohydrate as the carrier vehicle. This higher glucose concentration can also promote growth, proliferation and adhesion of *Candida* to the oral mucosal cells. (Thomas et al. 2010, 132.)

## **2.2 Oral Care Specific to Asthma Patients**

Correct and sufficient oral health care is important to all people of all ages, but even more so to patients suffering from asthma and receiving treatment, due to the increased oral health risks caused by many of the drugs utilized during the treatment process (Virtanen 2007, 12). Oral diseases are different from many other diseases in that they are predominantly self-preventable. Maintaining and learning the correct oral health habits right from childhood is essential in helping to prevent serious oral problems in the future. (Keskinen 2008, cited 25.1.2014.)

Daily preventive care, including proper brushing and flossing, will help to stop problems before they develop and it is much less painful, expensive, and worrisome than treating conditions that have been allowed to progress. In between regular visits to the dentist, there are simple steps that each of us can take to greatly decrease the risk of developing tooth decay, gum disease and other dental problems. These include:

- Brushing thoroughly twice a day and flossing daily
- Eating a balanced diet and limiting snacks between meals
- Using dental products that contain fluoride, including toothpaste
- Using xylitol products immediately after food, regular check-ups, etc. (Keskinen 2009, cited 3.2.2014.)

In Finland oral care for patients suffering from asthma includes two essential steps. The first step is "self-care", which means that asthma patients have to learn a regular oral health care routine for treating teeth before and after using asthma medications in addition to their daily oral care routine. The second step is "professional expert care" and this requires that each asthma patient gets certain instructions about the influence of asthma drugs on oral health. This concerns all health care professionals including: GPs, asthma- or general registered nurses, public health nurses and oral health professionals. For example, some materials and substances used in oral care can cause problems to asthma patients, for example allergies or hypersensitivity. This is why dental care professionals should know about their patient's conditions and medications used in his/her asthma treatment. (Honkala 2009, cited 25.1.2014.)

Asthma patients require a different and more intensive oral health care routine than others due to the increased oral health risks as a result of taking various forms of asthma medication. For example, asthma patients should always remember to rinse the mouth with water after taking asthma medication. A dry mouth after usage of asthma medication can be prevented and avoided by using non-foam fluoride toothpaste, rinsing the mouth with water and sucking on a dissolvable pastille/tablet. (Virtanen 2007, 14-17.)

Due to an increased risk for cavities and gum disease an asthmatic should, on top of performing regular oral health care:

- Increase frequency of dental maintenance visits with his/her dentist to prevent gum disease and cavities
- Make use of fluoride interventions such as fluoride supplements, especially if using b2 agonists inhalers
- Adhere to caries-prevention measures by following a good home care routine
- Recognize a possible need for antibiotic premedication
- Make use of techniques to reduce stress
- Be sure to update his/her dentist about any changes in medications, date of last asthma attack, latest emergency visit to hospital due to asthmatic complications, and factors that cause an asthmatic reaction.
- Take his/her medications pre-op and bring them to the office with him/her. (Steinbacher & Glick 2001, 1229-1239.)

It is evident that oral prophylactic strategies can be used to address the increase in caries risk in asthmatics. These include an increase in the frequency of dental maintenance visits, fluoride interventions and adherence to caries-prevention measures. Patients should be instructed to rinse their mouths after using an inhaler. Chewing a sugar-free chewing gum for at least one minute after using an inhaler can neutralize the interdental plaque pH. Chewing-gum also helps to stimulate salivary flow and buffer oral acid. Due to the high risk of erosion cause by gastro-esophageal reflux, antacids should be prescribed to patients having gastrointestinal disorders. The colonization by *Candida* in the asthmatics mouths can be reduced by using antimicrobial mouth rinses. (Thomas et al. 2010, 129-132.)

Whereas asthma is often found to increase the risks of causing various oral health conditions in patients, it is interesting to note that the opposite can also be true. One oral health condition that has been found to increase the risk of asthma in patients is gum disease. In one particular study, after patients were diagnosed with gum disease, researchers accounted for age, schooling level, osteoporosis, smoking habit and body mass index and still found that adults with gum disease were approximately five times more likely to develop asthma than those without gum disease. (British Dental Journal 2013, cited 27.1.2014.)

### **3 PUBLIC HEALTH SYSTEM IN FINLAND**

In practice in Finland there are three different health care systems which receive public funding: municipal health care, private health care and occupational health care. There are significant differences between these systems, for example in the scope of the services provided, user-fees and waiting times. There are also different public financing mechanisms for health care services in Finland. According to legislation, every municipality must have a health centre which provides primary health services. Additionally, legislation divides the country into 20 hospital districts (excluding Åland islands) which are responsible for the provision of municipal secondary care services. The Finnish health care system offers relatively good quality health services for reasonable cost with quite high public satisfaction. The most visible problems are long waiting times and personnel shortage in some municipalities. An ageing population, new medical technology, drug innovations and increasing population expectations will create challenges for the Finnish health care system in the near future. There are also some structures in the Finnish health care systems which are perceived as problematic: the level of decentralization, poor steering capacity in the system, relatively weak position of primary care, a lack of cooperation between primary and secondary care and dual financing. (Vuorekoski 2008, 1-4, cited 27.1.2014.)

#### **3.1 Primary Health Care**

The Primary Health Care Act obliges each municipality to have a health centre, which organizes and provides public and primary health care services to its residents. If there is a larger city there is usually several health stations, centres located in different areas. (Teperi, Porter, Vuorenkoski & Baron 2009, 48-50, cited 26.1.2014.)

Municipalities can either provide primary health services independently or join with neighboring municipalities in joint municipal boards which set up a joint health centre. Municipalities can also purchase some primary health services from private providers or hospital districts. Health centres provide occupational health care services for those



employers who choose to purchase these services from health centres. (Vuorenkoski 2008, 29, cited 27.1.2014.)

Health centres provide a wide variety of services, including for example preventive, maternity and child health service, dental care, etc. Most health centre staff a wide range of clinicians, including GPs, physicians from other clinical specialties, nurses, public health nurses, midwives, social workers, dentists, physiotherapists, psychologists and administrative personnel. (Teperi, et al. 2009, 48-50, cited 26.1.2014.)

Primary health service includes consultations with a GP for people who have become ill and for the treatment of chronic (long-lasting) illnesses, of which asthma is a part. Patients may be also referred to a specialist (secondary health care) or for further examination. Primary health care usually includes screening and vaccinations, oral health services, school and student health care, mental health services, emergency treatment, emergency cases also handled by hospitals, home care services, etc. Health centres often have a ward for patients requiring nursing care and they also provide health counseling, including health education, contraception advice, maternity and child welfare and medical examinations. (Ministry of Social Affairs and Health, Finland 2013, cited 28.1.2014.)

### **3.2 Public Health Nurse**

Public health nurses are professionals in public health and health promotion who come into contact with customers of various ages and in different life situations (Helsinki Metropolia 2013, cited 1.2.2014).

Nurses play an essential role in Finnish health centres. There are nurses with a general nursing education who, in addition to assisting GPs, have their own consulting hours for giving injections, removing sutures and measuring blood pressure. The role of nurses is currently also expanding in acute care and in assessing new patients. Nurses do not act as formal gate-keepers to the physicians, but in practice, seeing the nurse first is becoming a common route to a physician appointment. Maternal and child care are largely carried out by public health nurses who have specific training in preventive services. In addition to maternal and child health care, public health nurses are engaged in family planning, school health care, occupational health care, home nursing and all

kinds of health promotion activities. (World Health Organization 2014, cited 29.1.2014.)

The job of public health nurses may also include special treatment activities, such as diabetes or asthma patient care management and monitoring. The nurse also makes home visits. (Ammattinetti 2014, cited 31.1.2014.)

In Finland public health nurses receive their education at universities of applied sciences (also called polytechnics). The degree includes the registered nurses qualification. Completing the studies consists of 240 ECTS credits. (Finnish Nurse Association 2014, cited 27.1.2014.) These 240 ECTS credits include certain subjects that are compulsory to all students of the program, among them language, communication and patient interaction skills that are a necessity to all public health nurses. In addition, nurses are required to have a strong base in health care subjects, such as for example care required by adults versus children, nutrition, anatomy and physiology, pathology, etc. A complete listing of the program for the academic year 2013 – 2014 can be found in Appendix 1. (Oulu University of Applied Sciences 2015, cited 10.2.2015.)

Work tasks of the public health nurse include:

- Monitoring health trends and identifying health risk factors unique to specific communities
- Setting local priorities for health-related interventions to provide the greatest benefit to the most people
- Advocating with local, state and federal authorities to improve access to health services for underserved communities
- Designing and implementing health education campaigns and disease prevention activities, such as immunizations and screenings
- Educating people about locally available health care programs and services to improve access to care
- Educating and providing direct health care services to vulnerable and at-risk populations
- Working with individuals, families and communities to influence the design and development of services
- Improving population health, for example reducing obesity, alcohol abuse, improving sexual health behavior, etc. (Royal College of Nursing 2007, 1, cited 30.1.2014.)

A well-functioning training system (of nurses generally, including public health nurses) has ensured the high competence of Finnish nurses, thus making it possible to delegate many important functions to nursing staff instead of to GPs. Generally speaking, the role of public health nurses in preventive services has been decisive. A lot of new ways to encourage nurses in more independent roles for curative services are being tested. This should help to decrease costs, since more expensive GP labor can be focused on the types of care that truly require their medical training. (Teperi , et al. 2009, 67, cited 26.1.2014.)

A good example of how important the role of public health nurses in oral care is could be seen in the Government Decree (Valtioneuvoston asetus neuvolatoiminnasta, koulu- ja opiskeluterveydenhuollosta sekä lasten ja nuorten ehkäisevästä suun terveydenhuollosta 338/2011 9:3§), where it is stated that the public health nurse provides for children in the age range of 1-6 years at least 6 check-ups, of which one includes nurse's assessment of the oral health status.

## **4 RESEARCH METHODOLOGY**

The goal of my Bachelor thesis is to present a picture on the oral health guidance skills of public health nurses during their work with asthma patients. The research will be qualitative and the planned method of data collection is by interview.

After the thesis is done and there is a deeper and more complete picture of the guidance skills of the public nurses when working with asthma patients, this work could be used as an inspiration or base for creating or improving suggestions and ideas for multi-professional cooperation between public health nurses and oral health specialists and students.

Before embarking on the description of the chosen research methodology, I consider a definition of what research as a term refers to and entails important. There are usually many varied reasons why people decide to carry out a particular research. For many of them it could be the need to obtain a higher degree at their university of choice, or some organization can use research as a measuring tool to evaluate how effective their activities are and how best they could improve them. (Birley & Moreland 1999, 5.) In general textbooks, two main definitions on what research in general is can be found. The first definition sees research as a range of various practical skills and activities that are used to conduct particular types of investigation. This explanation defines what researchers do and the ways in which they do it. The second definition of research sees the research as the way of thinking. In this definition, research is about asking critical questions, thinking about them, checking the evidence and utilizing this to understand phenomena, some problem or given issue more clearly. (Walsh & Wiggins 2003, 1.)

### **4.1 Qualitative Research**

The methodology applied in my Bachelor thesis is qualitative research. I chose qualitative research as my research methodology because in the thesis I would like to ascertain and describe how well public health nurses know the importance of oral health in asthma treatment and the extent of their ability and competence in providing oral health care guidance for asthma patients. Another reason why qualitative research is a

good choice in this particular case is due to the fact that the test set is small, so the data will be better reflected in qualitative rather than in quantitative research mode.

The starting point in qualitative research is real-life scenarios. This kind of research aims to describe the items to explore as comprehensively as possible. (Hirsjärvi, Remes & Sajavaara 2007, 157.) Qualitative research is about setting up a given scenario and trying to make sense of it. The purpose of qualitative research is to examine and make note of small cues in order to decide how to behave, as well as to make sense of some content. An essential part of qualitative research is that researchers believe that the empirical and theoretical resources needed to comprehend a particular idea, or to predict its future trajectory, are themselves a part of the context in the research scenario. (Tracy 2013, 3.)

Qualitative research can be also known as "understanding research" and "human research". Understanding research means a study in which the studied phenomenon can be understood or explained. This requires the researcher's empathy with the phenomenon's spiritual atmosphere, thoughts, feelings, and motives, so that he/she is able to understand the idea of the world of investigated persons. Human research refers to the human-created reality as the reality of the importance of research. (Tuomi & Sarajärvi 2002, 27-28.)

Typical features of qualitative research are the qualitative research data collection methods, the perspective (point of view) of the examined/studied object, discretionary or theoretical sampling, the qualitative-inductive analysis of data, research genre, the presentation of the results and also the researcher's role and narrative (Eskola & Soranta 2001, 13-15).

The concept of research design within qualitative research is more problematic than within quantitative research, with alternative terms including: research methodology, research approach and research type. Reflecting on qualitative research, it is possible to describe research design as the way in which a research idea is transformed into a research project or plan that can then be carried out in practice by a researcher or research team. (Cheek 2008, 761-763.)

## 4.2 Research Questions and Objectives

Research should always have a specific purpose or task which should be made on the basis of strategic choices. The purpose of the study can be characterized by four main features: description, explanation, prediction and scanning. (Hirsjärvi, Remes & Sajavaara 2009, 137-138.) The questions "what, why and how to" are the guide for the research and give it direction. Through the research task it is possible to explain the subject of the phenomenon or phenomena related events from research perspectives. If necessary, the questions "how and why" could also be used. (Kylmä & Juvakka 2007, 26.)

Generally speaking, the precise formulation of the research question is a central step when performing research design. Research questions should be examined critically as to their origin. It is possible to assess research questions as to how far they are suitable for confirming existing assumptions (like hypotheses) or how far they aim at discovering new ones, or at least the extent to which they would allow this. (Flick 2009, 101-102.)

The purpose of this study/research is to show what kind of instruction public health nurses provide to their asthmatic patients about oral health and the right oral care. One of the objectives is to find out what and how much the public health nurses know about the side effects of asthma medications on oral health. In this research the perspective of public health nurses about their ability to provide information and guidance to the asthma patients regarding oral health will also be examined. The results of the study could be later used as, for example, a base/background for creating/developing a guide book about asthma patient's oral health guidance for public health nurses.

Based on theory sources and on the frame of references the research tasks/goals may be categorized into the following main themes:

- The extent of the knowledge of public health nurses on the influence of asthma drugs on an asthma patient's oral health
- The various factors that public health nurses take into account while giving guidance about oral health for asthmatics
- The kind of information public health nurses have regarding oral health care guidance for asthma patients

- A discussion on how public health nurses could contribute to the development of oral health care for asthma patients

### **4.3 Realization of Research**

The main ideas guiding qualitative research are of course different from those ones in quantitative research. The essential features of qualitative research are: the correct choice of appropriate methods and theories, the recognition and analysis of different perspectives, the researchers' reflections on their research as part of the process of knowledge production, and finally the variety of approaches and methods. (Flick 2009, 14.)

It is important to realize that qualitative research methods, probably to a greater degree than quantitative approaches, are highly dependent on the knowledge and skills of all members of the research team or on the researchers themselves. Conducting a good qualitative study, just like conducting a good quantitative project, requires attention to issues of study design, the unit of analysis, sampling techniques, instrument development, and also administration and analysis plans. (Soafer 2002, 329-336.)

### **4.4 Interview as a Method of Data Collecting**

Qualitative approaches to data collection usually involve direct interaction with individuals on a one-to-one basis or in a group setting. Data collection methods are time consuming and consequently data is collected from smaller numbers of people than would usually be the case in quantitative approaches such as the questionnaire survey. The benefits of using these approaches include richness of data and deeper insight into the phenomena under study. Unlike quantitative data, raw qualitative data cannot be analyzed statistically. The main methods of collecting qualitative data are individual interviews, focus groups and observation. (Hancock 2002, 9, cited 8.2.2014.)

Using qualitative methods implies that data generated will be primarily in the form of words, not numbers. Some of the most common data collection methods are different types of individual interviews (general or key informants) and group discussions. (Patton & Cochran 2002, 11, cited 8.2.2014.) Interviews are the most commonly used

qualitative techniques also in health care settings. Health care specialists routinely interview patients during their clinical work, and they may wonder whether simply talking to people turns into a legitimate form of research. (Pope & Mays 2006, 12.)

There are three fundamental types of research interviews: structured, semi-structured and unstructured. Structured interviews are, essentially, verbally administered questionnaires, in which lists of predetermined questions are asked, with little or no variation and with no scope for follow-up questions to responses that may warrant further elaboration. They are usually quick and easy to use, but their drawback is that they only allow for limited participant responses and are, therefore, of little use if depth, or a different perspective, is required. Conversely, unstructured interviews do not reflect any preconceived theories or ideas and are performed with little or no organization. They are usually very time-consuming (often lasting up to several hours) and can be difficult to manage. Their use is, therefore, generally only considered where significant depth is required, or where virtually nothing is known about the subject area. Semi-structured interviews consist of several key questions that help to define the areas to be explored, but also allow the interviewer or interviewee to diverge in order to pursue an idea or response in more detail. This interview format is used most frequently in health care, as it provides participants with some guidance on what to talk about, which many find helpful, while still permitting for a degree of leeway if and when necessary. (Gill, Stewart, Treasure & Chadwick 2008, 291.)

As it was mentioned above, semi- structured interviews are perhaps the most adequate tool for realizing qualitative research in health care. In my case, it will permit me to build a structured approach to the areas of interest while still allowing the interviewees to express their opinions and thoughts sufficiently and also diverge off the main line of questioning if they feel it is necessary. For this reason I have chosen to apply this particular type of data collection method to my thesis.

The main feature of semi-structured interview is open-ended questions defining the area to be explored, and these questions are conducted on the basis of a loose structure (topic guide). It is very important to develop the right questions to ask and to remember that the respondent is unlikely to share your perspective on the world. A topic guide usually has a list of the key questions the interviewer would like to cover, with some useful



prompts to encourage the interviewee to talk about specific issues if they do not come up spontaneously. (Patton & Cochran 2002, 11-12, cited 8.2.2014.)

The topics for the interview were chosen according to what kind of results are expected from the interview and what kind of theoretical sources were essential in formulating research questions (which were presented earlier in the thesis). After the research questions were formulated there were four main topics formed. After the topics were set, the frame of interview was carried out. In the beginning of the interview, questions regarding general information about public health nurses were asked, such as their main education, special courses, specializations, etc. The first topic talked about knowledge of public health nurses about oral health of asthma patients. In the second topic answers to questions about what public health nurses take into account while giving guidance about oral health for asthmatics were sought. The third topic left space for the nurses' own assessment of their guidance skills in oral health for asthma patients, and also for expressing their need or suggestions for further education. In the fourth and the last topic, nurses were asked to suggest how would be in their opinion possible to improve/develop oral health care for asthmatics. For each one of the main topics questions which will bring out the answers to the research questions were formulated. The frame of the interview (in both, English and Finnish language) is presented in Appendix 2 and Appendix 3.

#### **4.5 Identifying Sources/ Interviewees**

Sampling strategies should always be determined by the purpose of the research project. Statistical representativeness is not normally sought in qualitative research. (Pope & Mays 2006, 18.) It is important to select your sample in a systematic way so as to ensure that the community, users and external actors see it as a credible and indicative sample. Samples in qualitative research are usually purposeful. This means participants are selected because they are likely to generate useful data for the project. Sample sizes are typically small in qualitative work. One way of identifying how many people you need is to keep interviewing until, in analysis, nothing new comes from the data – a point called "saturation". (Patton & Cochran 2002, 9, cited 8.2.2014.)

In this research the interviewees were public health nurses working in health care centres in the city of Oulu. For this interview, public health nurses who usually have (in addition to usual public health care tasks) expertise, knowledge and experiences in working and guiding asthma patients were selected. The goal of this study was to interview 4- 5 public health nurses from different health care centres in the Oulu city. Additionally, the research was performed in the interviewed nurses' offices to get a clearer picture of their working environment and their possibilities in providing guidance to asthma patients on oral health issues.

#### **4.6 Handling and Analyzing Qualitative Research Data**

During the process of handling the data, the interviewers have a choice of whether to take notes of responses during the interview or to tape record the interview. There are two possibilities on how to write notes: notes written at the same time or notes written afterwards. Writing notes at the same time can interfere with the process of interviewing, and notes written afterwards are likely to miss out some important details. (Pope & Mays 2006, 18.) Lastly, interviewees may feel inhibited if the interviewer suddenly starts to scribble: they may wonder why what they have just said was of particular interest (Hancock 2002, 14, cited 8.2.2014).

The tape record is preferable for a number of reasons. The interviewer can concentrate on listening and responding to the interviewee and is not distracted by trying to write down what has been said. The discussion flows because the interviewer does not have to write down the response to one question before moving on to the next. (Hancock 2002, 14, cited 8.2.2014.) For purpose of this thesis the tape record technique was used to collect data from the interviewees.

After data were collected and handled it was important to know how to prepare interview data for analysis. This process is called transcription of the data. (Grbich 2013, 20.) Transcribing is the procedure for producing a written version of the interview. It is a full "script" of the interview. Transcribing is a time consuming process. It produces a lot of written text as one interview can run up to 20 pages. (Hancock 2002, 14, cited 8.2.2014.) After handling all outcomes from all interviews there were 20 pages of raw text.

It is not possible for a researcher to collect data forever. Sooner or later something has to be done with the data to give it significance. That something is analysis. Generally speaking, analysis is a process of examining something in order to find out what it is and how it works. It is a very dynamic process which has to brainstorm, try out different ideas, eliminate some and expand upon others before arriving at any conclusions. (Corbin & Strauss 2008, 45-47.)

Analysis of data in a research project involves summarizing the mass of data collected and presenting the results in a way that communicates the most important features. In quantitative research analysis involves things like the frequencies of variables, differences between variables, statistical tests designed to estimate the significance of the results and the probability that they did not occur by chance. All this is done basically by counting how often something appears in the data and comparing one measurement with others. At the end of the analysis, not only do we have a mass of results but we also have what we might call "the big picture", the major findings. In qualitative research we are also interested in discovering the big picture but use different techniques to search for it.

After the transcription was done, I went through all the text several times in order to be able to get a good overview of the research material. The basic process of analyzing quantitative and qualitative data is the same. It starts by labeling or coding every item of information so that we can recognize differences and similarities between all the different items. Coding qualitative data requires different techniques than coding quantitative data. The qualitative researcher has no system for recoding, therefore he/she requires a method of identifying and labeling (coding) items of data which appear in the text of a transcript so that all the items of data in one interview can be compared with data collected from other interviewees. This requires a process called content analysis. The process of content analysis involves continually revisiting the data and reviewing the categorization of data until the researcher is sure that the themes and categories used to summarize and describe the findings are a truthful and accurate reflection of the data. (Hancock 2002, 16-18, cited 8.2.2014.)

#### **4.7 Research Ethics and Trustworthiness**

Qualitative research is often planned as very open and adapted to what happens in the field. Research ethics is an important issue in planning and doing qualitative research. It is not often possible to find easy and very general solutions to the problems and dilemmas. It has a lot to do with sensitiveness and reflection. Giving consideration to ethical dilemmas should help to carry out research in a more reflective manner, and to take the participants' perspective on a different level, rather than prevent the researcher from doing research. (Flick 2009, 43.)

Theoretically everything (private conversations, undercover participation, etc.) can be used in research to gain the knowledge to answer a research question. In practice, however, it does not work that way. Researchers have to follow ethical rules of behavior to prevent them from doing harm to others and to protect themselves. Ethics are concerned with finding a balance between the benefits and risks for harm. (Boeije 2010, 43.)

A researcher has responsibilities not just to the research participants, but also to his/her colleagues and the people to whom he will present the results. There are four main principles in considering ethical concerns (autonomy; respect the rights of the individual, beneficence; doing good, non-maleficence; not doing harm, justice; particularly equity). A researcher has to carefully consider the context in which he/she will be working, the aim of the research and how sensitive the topic might be. His/her questions may be traumatizing, or they may make the respondent feel uncomfortable, etc. Two key ethical issues that should be considered in any project are consent and confidentiality. Consent means that participant should be well-informed about what participation entails, and reassured that declining will not affect any services they receive. Confidentiality means that the identity of the participants must be protected at all times and not be left lying around in notebooks or un-protected computer files. (Patton & Cochran 2002, 5, cited 8.2.2014.)

All researchers must be familiar with the basic ethical principles and have up-to-date knowledge about policies and procedures designed to ensure the safety of the research subjects, and also to prevent sloppy or irresponsible research. Ignorance of policies

designed to protect research subjects is not considered a viable excuse for ethically questionable projects. Therefore, the responsibility lies with the researcher to seek out and fully understand the policies and theories designed to guarantee safe and upstanding research practices. A list of ethical guidelines for the conduct of research – the Nuremberg Code - consisted of ten basic ethical principles that the accused violated.

1. Research participants must voluntarily consent to research participation
2. Research aims should contribute to the good of society
3. Research must be based on sound theory and prior animal testing
4. Research must avoid unnecessary physical and mental suffering
5. No research projects can go forward where serious injury and/or death are potential outcomes
6. The degree of risk taken with research participants cannot exceed anticipated benefits of results
7. Proper environment and protection for participants is necessary
8. Experiments can be conducted only by scientifically qualified persons
9. Human subjects must be allowed to discontinue their participation at any time
10. Scientists must be prepared to terminate the experiment if there is cause to believe that continuation will be harmful or result in injury or death. (University of Minnesota: Center for Bioethics 2003, 3-4, cited 12.2.2014.)

The Nuremberg Guidelines paved the way for the next major initiative designed to promote responsible research with human subjects, the Helsinki Declaration, which has been periodically updated since 1964. The document lays out basic ethical principles for conducting biomedical research and specifies guidelines for research conducted either by a physician, in conjunction with medical care, or within a clinical setting. (World Medical Association: Declaration of Helsinki 1964, cited 12.2.2014.)

Following the Helsinki Declaration, the next set of research ethics guidelines came out in the Belmont Report of 1979 from the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The Nuremberg, Helsinki, and Belmont guidelines provided the foundation of more ethically uniform research to which stringent rules and consequences for violation were attached. (University of Minnesota: Center for Bioethics 2003, 5, cited 12.2.2014.)

## **5 THE RESULTS OF THE STUDY**

The research permit was issued by the City of Oulu in October of 2014. Public health nurses working with asthma patients on a daily basis in health care centres in the city of Oulu were chosen as the source of interview data for this study.

The interviewees' contact information was obtained through the service manager of the open health care, health centre districts of Oulu. During the process of research authorization (October and November of 2014), the service manager contacted service managers of health care centres and requested them to inquire among their own public health nurses for potential volunteers willing to take part in the research and provide their contact information. Contact information was obtained from 5 nurses who showed interest in taking part in the research. Thereafter, the volunteers were contacted by e-mail with the frame of the interview, and a cover letter was sent to each interviewee. The interviews themselves were realized during the period of December 2014 and January 2015.

Content analysis was chosen as the method of result analysis. The selection of samples of analysis was not affected by the researcher's own preconceptions, knowledge or assumptions. All the interviewees' answers were transcribed carefully and congruently.

### **5.1 Interviewees General Information**

The basic professional qualification of all interviewees is that of a general nurse. Four of them have specialization and are public health nurses. Additionally one of them has a Masters Degree in Health Science.

"I went to the University of Applied Sciences, I am a nurse." (Interviewee 2)

"Well I am a public health nurse and Master of Health Science." (Interviewee1)

"I am a public health nurse, or a public health nurse/a nurse. There they come both together." (Interviewee 4)

Just one of the interviewed nurses has attended additional professional training pertaining to her profession, diabetes nurse training, and has specialization in treating patients suffering from diabetes.

"Diabetes nurse. We have quite many of these (trainings), but this was a one-week training, diabetes nurse training, we were in the diabetes union's premises." (Interviewee 1)

While conducting the interviews it emerged that all 5 interviewed public health nurses have attended additional asthma/allergy training, which was provided either by Oulu University Hospital, pharmaceutical companies, Finnish Pulmonary Association (Heli) or the city of Oulu.

"Yes. We have those annually, our hospital, OUH (Oulu University Hospital) is organizing." (Interviewee 2)

"Yes, so these OUH's regional trainings and then some few other smaller trainings." (Interviewee 5)

"We have smaller trainings when new products arrive." (Interviewee 1)

"I have attended. What's the union... asthma, breathing... trainings organized by Heli, that kind of one day long trainings." (Interviewee 3)

"Yeah that kind of one day long introduction and then at the City of Oulu we have those asthma nurses' trainings 4 times a year." (Interviewee 4)

While interviewing the nurses it emerged that even though different additional trainings or lectures for public health nurses are being organized with asthma or allergy as a topic, unfortunately, according to interviewees, there is either not enough of them or there is usually not enough room for all the nurses that would want to take part.

"They are organized several times a year, trainings, but participation is limited, only part of the nurses is going. Not everybody can attend." (Interviewee 1)

". . . it's not hard to get there, but it's that there are not so many of those trainings in this area. So maybe that's the challenge. Maximum once per year. It's quite small amount." (Interviewee 5)

Three of the nurses have been working in a public health care centre for 8 years, two of them have had a shorter history in working for the public sector, health care centre, and one of them had 3 years, while another only 3 months. The nurse working in a health care centre for just only 3 months has a long working history (12 years) in occupational health care.

"I have been working as a public health nurse for 8 years in a health care centre." (Interviewee 1)

"For about three years." (Interviewee 4)

"I have been working in a health centre just for 3 months. I was working in occupational health care for about 12 years." (Interviewee 3)

The interviewees' usage and application of their working time with asthma clients varies quite widely. Because public health nurses treat different patients with different diagnoses on a daily basis, for some of them it was difficult to give a concrete number of hours that they spend with asthma patients per day or per week. Where some of them estimate that they spend only a few of their working hours a week or a day with asthma patients, another estimate it as being up to 8 hours a day. The basic requirement for asthma patients' care was already set in the early stages of the research, but there was no separate requirement given regarding its intensity or level.

"It's hard to say, because the work is varying so much and for instance many patients at the emergency duty have asthma and on 'list days' when there is nurse reception for the patients that have booked an appointment, also some of them are asthma patients." (Interviewee 1)



"Well I think about one or two hours in a week. Not every week there are or sometimes there are more of patients then." (Interviewee 2)

"Maximum of one hour per day, and even that is not every day." (Interviewee 3)

". . . yes, asthma is visible in daily work, amount of hours is difficult to say. Anyway I spend several hours in a week with asthma matters." (Interviewee 4)

"Yes very precisely. I have 8 hours a week reserved for asthma controls and one appointment is always lasting for one hour, so eight customers per week." (Interviewee 5)

## **5.2 Knowledge of Public Health Nurses about the Influence of Asthma Drugs on Oral Health of Asthma Patients**

In research the knowledge of public health nurses about the influence of asthma drugs on oral health of asthma patients who are coming to health care centres to receive treatment or guidance is demonstrated. The goal was to explain the interviewees' knowledge about the general side effects of asthma drugs as well as their effects on oral health. The influence of asthma drugs on dental decay and understanding the connection between asthma drugs and periodontal diseases was also one of the goals.

Because asthma is considered as a national disease in Finland and is well known among the population, public health nurses did not have any problems describing the typical general side effects of asthma drugs on patients' general health status, as for example: hoarseness, sore throat or arrhythmia.

"Yes, well there might appear hoarseness of the voice, sore throat." (Interviewee 1)

"Well of course mouth and throat problems and hoarseness of the voice is one and what else. Those are probably the most common ones." (Interviewee 2)

"Well controllers (Long-Term Control Drugs) can cause infections to throat and palate and then may cause palpitations and so on." (Interviewee 3)

"Well of course controllers may cause arrhythmia and then if you don't rinse your mouth, it may cause damages to your teeth and aphthae on mucous membrane." (Interviewee 4)

"Well actually just like cortisone, they don't really have that much of other side effects than in mouth, mucous membrane problems, and hoarseness of the voice. They are most common problems and then some people have problems that they lose their voice or hoarseness of their voice, those are the most common problems." (Interviewee 5)

Regarding the side effect of asthma drugs on patient's oral health, all nurses recalled that there is a significant connection between asthma drugs and oral health, especially when patients do not have a suitable, correct oral health care routine. According to interviewees this usually leads to candidiasis or inflammations in the oral cavity.

"Yes, they affect a lot, if you don't take care of your oral hygiene." (Interviewee 5)

"Yes they do affect if they stay in mouth and you don't clean your mouth and they cause oral candidiasis and fungal infection." (Interviewee 2)

"Yes so there might occur some candidiasis and this kind of things in the mouth, sensitivity to the tongue, more easily." (Interviewee 1)

"If you don't take care of mouth hygiene properly it might cause that kind of coated tongue which is like candidiasis or yeast infection." (Interviewee 3)

While asking the nurses opinion about connection between asthma drugs and tooth decay, answers varied significantly. One nurse did not know how to answer this question, while one nurse simply described that there should be some connection between using of cortisone and its influence on enamel. The rest of the interviewees explained what in their opinion the connection between tooth decay and asthma drugs is. According to their knowledge, dental decay is caused by low dental hygiene and insufficient mouth rinsing after usage or application of asthma drugs, as well as wrong/incorrect dosing technique.

"That I cannot say." (Interviewee 1)

"Well I cannot tell fully complete answer, whether there is a connection. Of course cortisone will effect on tooth enamel and surface, so there might be a connection." (Interviewee 2)

"Well I have been told that if you take controllers (asthma medicine) when you have dirty teeth, it may cause caries and enamel damages." (Interviewee 3)

"With my knowledge, it is increasing (risk of dental caries development) especially if you don't go for check-ups regularly and if you don't remember to rinse your mouth and brush your teeth. Then it is significantly increasing the risk." (Interviewee 4)

". . . it matters a lot, especially if asthma is noticed when you are youngster or a child, you are using medicine for decades, you don't take care of brushing your teeth before taking the medication. It matters a lot." (Interviewee 5)

Just some of the public health nurses were able to explain the connection between periodontal diseases and asthma drugs. They described that gingivitis is caused by the drug remaining in the mouth. Additionally they were able to explain which factors cause the asthma drug to stay in the oral cavity. They once again emphasized how important it is for asthma patients to rinse all the drugs out of their mouth after every usage/application. They mentioned that cortisone, especially, is harmful to the supporting tissues.

"Well probably, I haven't come across it though, but probably in a way that if you think that you would have candidiasis or yeast infection on your palate, tongue or throat, probably the same bacteria would appear in your gums so it causes higher risk of gum infection if you don't take care of your mouth before and after medication." (Interviewee 3)

". . . well probably in the same way that when cortisone gets on your mucous membrane and on your gums, so there is a connection." (Interviewee 4)

### **5.3 Factors, which the Public Health Nurses Take into Account while Giving Guidance about Oral Health for Asthmatics**

The aim of this research task was to clarify whether and how public health nurses check oral health of asthma patients at their offices, if and what kind of oral health-related guidance they are able to provide, as well as to discover what the interest of asthma patients is regarding oral care- related topics and problems.

During the interview it appeared that the main focus in asthma patient's guidance is attached to other areas of the health as well as to the mouth / oral area. Public health nurses described that guidance at their office usually includes drug counseling and information on oral health-related issues. The discussed topics usually relate to oral home care, dental services as well as the side effects of asthma drugs on oral health. The patients are also usually provided with written instructions about the drugs, where these same oral health- related topics are also handled. All of the interviewed nurses also said that they usually explain to the patients the order in which it is necessary to implement home oral care and take drugs.

"In that guidance we are guiding PEF blowing, technique for taking the medicine, many things. So when we are guiding an asthma patient how to take their medicine, we are also guiding them to rinse their mouth after taking the medicine, spurt with water and spit the water out. And that when they are brushing their teeth, they are recommended to brush their tongue as well." (Interviewee 1)

"We are also guiding that a patient must go to regular check-ups and remember to rinse their mouth after taking their medication so there wouldn't be any cortisone left in their mouth." (Interviewee 4)

"On each appointment when they come to my office for asthma annual checking, I start talking about mouth hygiene so when I'm asking to show how they are taking the medicine, first of all I pay attention to whether the patient is able to breathe the medicine in but also how the equipment is in patient's mouth, is it in the right angle so that the mucous membrane wouldn't be affected by the cortisone or whatever the

medicine is. And then always emphasizing each time that the patient has remembered to rinse the mouth and spurt the throat and spit the water out." (Interviewee 5)

Nurses described that at their office they usually do not check the oral health of the patient physically, unless the patient complains about some issues, but they evaluate the oral health condition by interview or discussion with the patient regarding home oral care, drug consumption, etc. If after the evaluation the nurse concludes that a physician's or dentist's check is required, they will recommend the patient for the next treatment.

". . . by asking the client and then if he/she has symptoms while coming for check-up, of course I check if there is any oral candidiasis, is mucous membrane looking irritated." (Interviewee 5)

". . . if there is some fungus or something like that, then we start to think that well we need doctor's consultation and how to proceed." (Interviewee 4)

One interviewed nurse mentioned that patients will sometimes visit a dentist or physician immediately without prior discussion of their oral health symptoms with their public health nurse.

"Symptoms connected to oral health show up rarely, and if they (clients) have hoarseness then we are going through the technique how to take their asthma medication and guiding that they should spurt their mouth with water. It is also quite possible that they usually contact their dental clinic or dental hygienist." (Interviewee 1)

On the other hand, another nurse said, that according to her experiences, patients usually do not go to visit a dentist if there appear to be some symptoms in their oral cavity. She explains that for example if a patient has white plaque on his/her tongue, they usually think it does not belong to dental care as the symptom is not on their teeth.

"Patients are probably not going too often to see a dentist. So, I don't know. I think that they don't probably go because the symptoms are not in their teeth when there is white plaque on their tongue." (Interviewee 2)

Three nurses expressed that in their experience, they have been questioned by patients about oral health care related problems. Clients usually asked about problems with soft tissues, as for example white changes on their tongue, but they rarely asked questions about teeth conditions or problems.

"They usually don't start talking at all about those things and if something appears in their mouth, then there is some pain in their mouth or aphthae in mouth or..." (Interviewee 1)

"Sometimes someone is asking, it's more about the hoarseness that well sometimes they show that they got some white plaque in their mouth or that after taking the asthma medicine, the taste stays in their mouth." (Interviewee 2)

"...they ask that if they have got sore throat or hoarseness or then they have noticed some white spots on palate or tongue, usually it goes that way, not about teeth." (Interviewee 3)

#### **5.4 Knowledge Available to Public Health Nurses Regarding Oral Health Care Guidance for Asthma Patients**

Public health nurses were asked to assess what kind of oral health-related information they got during their professional studies, as well as what kind of additional courses are available for them. A few of them also expressed their interest in and requirement for additional education in oral health care related issues for asthma patients.

Invariably, all of the interviewed nurses said that during their professional studies they have received only limited information regarding oral health-related issues.

"Just a little related to asthma patients...." (Interviewee 1)

"...well that kind of theory based training I don't remember having at all. It's been a long time." (Interviewee 2)

"Quite concise/short, we did have maybe two lectures of that. Yes it was kind of a small amount what I got from there." (Interviewee 4)

They also described that they have received information about the relation between asthma drugs and oral health by attending asthma meetings for nurses and additional courses or through self-study, for example by reading professional articles and recommendations.

"... well yes we do talk about oral care in asthma meetings and trainings." (Interviewee 2)

"I have received that kind of information on asthma trainings, for example about oral health care, throat treatment . . ." (Interviewee 3)

"Maybe on the asthma meetings it is sometimes partially mentioned . . ." (Interviewee 4)

One of the interviewed nurses, a holder of a Master of Health Science degree, described that whereas she has received sufficient information about asthma-oral care related issues during her master studies, the same does not apply to her bachelor level studies.

". . . but otherwise during my master degree studies I have attended oral health care courses and so on. From there I have knowledge about oral and teeth care from these courses . . ." (Interviewee 1)

Nurses have expressed their interest in attending additional oral health-related courses or workshops, but unfortunately, they do not have enough opportunities, or, in their opinions, the problem of asthma and how it relates to oral health has been hardly or not at all addressed, with a very few exceptions.

"There is very small amount of oral care related training for public health nurses." (Interviewee 1)

"I'm not aware whether we have any special training days, and also the question is if you can get yourself into those." (Interviewee 4)

"I haven't seen ever that there would be such a course." (Interviewee 5)

Nurses would be interested in additional courses and they would require more courses oriented towards the influence of drugs/medication on oral health, general diseases and oral- health relation, dental hygiene generally, etc.

"There could be this type of training about how medicine affects teeth, arranged for public health nurses." (Interviewee 1)

"Well comprehensive training that would include also oral care and teeth care." (Interviewee 2)

"Well perhaps this kind of general diseases-related couple hours' course to refresh and update knowledge could be good to organize." (Interviewee 4)

One of the nurses described that it would be good to also organize more courses for nurses who are new to relating with and treating asthma patients, or for those who have not attended asthma related courses previously.

"Well at least for that kind of a person who hasn't like been in asthma trainings would be good to go through just basic things." (Interviewee 3)

## **5.5 Public Health Nurses Ideas for Development/Improvement of Oral Health Care for Asthma Patients**

The aim of this research question was to get the nurses ideas towards improving oral health care for their asthma patients. With this question nurses also got an opportunity to express their opinion about what kind of inter-professional cooperation they would like to do with other oral health care professionals.



All of the interviewed nurses have a lot of different ideas how it would be possible to improve oral health care for their patients. For instance, one of the nurses suggested co-operation with certain dental hygienists, who would be specialized in working with asthma patients. Another nurse suggested group sessions for asthma patients with dental nurses.

"I would like for asthma patients that there would be a dental hygienist, a specific/on-call dental hygienist, to whom I could refer." (Interviewee 1)

"They could go to general training held by a dental nurse. There could be 10-15 people and a dental nurse would be explaining." (Interviewee 2)

One of the interviewed nurses would organize workshops or lectures for patients suffering from asthma, where they could update their knowledge about asthma and its treatment possibilities as well as to get a peer.

"...probably that we would get some training about what those basic things are, what things other than aphthae and enamel damage can occur. That we would have the knowledge, so we could maybe answer better." (Interviewee 4)

All of the interviewed nurses expressed their interest in cooperation with dental health care professionals or students. They would appreciate a possibility to contact a dental hygienist made aware of the problem/situation by phone or by email as and when required. They would like dental hygiene students to organize events for them and/or patients, where they could explain the connection between asthma and oral health, and present their explanation with both oral and written materials.

"That there would be an effortless connection to a dental hygienist, contact details for whom you could send for instance an e-mail or call to. It would be good if dental hygienist students would come to health centres to make presentations, to tell about things to nurses and also to patients. And that there would be some brochure deliveries so that asthma patients could see written material about dental care so they would remember it." (Interviewee 1)

"Well there could sometimes be somebody from that side coming to tell that what kind of changes or difficulties this kind of cortisone based asthma medications can cause to mouth and teeth." (Interviewee 3)

One of the interviewees also described that nurses and GPs do not have access to the patient records made by dental health care professionals and vice versa, dental health care professionals cannot read patients records made by nurses or GPs. That is why in her opinion inter-professional cooperation and records accessibility would be more efficient and more beneficial for the patient.

"That kind of common reception records system (patient records), where you could see those records, that already exist from previously visited medical centres, that you could see that he/she (patient) has been there and guidance has been done in such and such kind of way, then it would be possible to remind the patient of what has been agreed with that medical centre. Currently these medical centre records are somewhat separate so you don't necessarily see (all the relevant records). You just have to trust what the customer has told you." (Interviewee 4)

## **6 DISCUSSION AND OVERVIEW**

The purpose of this study was to find and demonstrate what kind of instruction public health nurses provide to their asthma patients regarding oral health and the right oral care. One of the objectives is to analyze the extent of public health nurses' knowledge about the side effects of asthma medications on oral health. In this research, public health nurses are interviewed and asked to rate their ability to provide information and guidance to the asthma patients regarding oral health.

### **6.1 Public Health Nurses Knowledge on Influence of Asthma Drugs**

Through this research question I wanted to demonstrate what kind of knowledge nurses have about the relation between asthma drugs and oral health. The study revealed that nurses have a lot of knowledge and information about side effects of asthma drugs on the general health condition of the asthma patients, but unfortunately information about oral health, in practice, needs to be supplemented and augmented.

Public health nurses have a very good knowledge on asthma drugs, especially corticosteroids and their influence on general health, as this is part of their general job description, especially if they are working with asthma patients on a daily basis. In this part they were able to emphasize certain side effects such as throat hoarseness, sore throat and arrhythmia. According to the interviewed nurses, there is a significant connection between asthma drugs and oral health, especially when the patient does not observe sufficient oral health care routines. According to the nurses, this usually leads to inflammation in the mouth or candidiasis. Wrong oral hygiene and incorrect asthma drug dosing technique were mentioned as the cause of tooth decay in asthma patients by some nurses. On the other hand some nurses did not know how to explain the connection between asthma drugs and increased tooth decay rate. Unfortunately, none of the inter-viewed nurses mentioned that lower salivary flow combined with sugar contained in some inhalators can increase risk of caries. Interviewed nurses have significantly less knowledge on the connection between asthma drugs and periodontal diseases, but still they were able to describe that periodontal diseases could be caused by drugs remaining in the oral cavity. None of them mentioned that periodontal diseases

in asthma patients can also be caused by immunological factors (activation of the immune and inflammatory process) or the interaction between the drugs and immunity.

## **6.2 Public Health Nurses as Oral Health Guides for Asthmatics**

It is natural that the main focus of public health nurses while working with asthma patients is on the general disease/condition (asthma) itself and its management. That is why, unfortunately, the oral health condition is usually diminished and has too little attention as part of the total asthma treatment. This research question discusses if and how public health nurses check on oral health of asthma patients and what kind of oral health- related guidance they are able to provide. It was also revealed what kind of oral health- related topics are usually discussed with patients.

According to the study nurses are usually focused on general conditions as well as on the oral health. On a regular basis, clients are usually provided with guidance on medications and are provided with information on oral health- related issues. They are also given written instructions and information about side effects of asthma drugs on oral health and oral home care. All of the nurses explain to the patients the order in which it is necessary to implement home oral care and take drugs. A public health nurse's work description does not include checking up on patients' oral health of, that is why in practice nurses will check on oral cavity only when the patient is complaining about some issues, such as irritation in the mucous etc. Patient's oral health condition is evaluated by interviewing or discussing home oral care, drug consumption, etc. Once evaluation is done, if the nurse still considers that oral health specialist opinion is needed, she can refer the patient to a dental clinic. In some cases patients are active themselves and if problems occur in the oral cavity they call straight to the dental clinic. On the other hand, if there are changes on the patients mucous, he/she does not consider it to be an oral health- related issue and prefers to consult with a public health nurse. Problems and changes in soft tissues (for example white changes, spots on the tongue) are more likely questioned by patients than teeth conditions or problems themselves.

### **6.3 Knowledge of Public Health Nurses about Asthmatics Oral Health Care Guidance**

In this research question nurses got room to assess their level of education and knowledge on oral health- related topics. They were asked to evaluate knowledge they received during their professional studies as well as possibilities to attend additional courses focusing on oral health of asthma patients, which are made available to them.

There is not enough oral health- related information provided during professional studies for public health nurses. Additional courses or self-study usually work as a source of information and knowledge for nurses. Valuable information about asthma and oral-health is, according to the interviewees, provided in asthma meetings. Nowadays courses oriented towards oral health are organized rarely. Nurses would require more additional courses with topics as the influence of drugs/medication on oral health, gen-eral diseases and oral- health relation, dental hygiene generally, etc.

### **6.4 Ideas for Development and Improvement of Oral Health Care for Asthmatics**

Public health nurses got opportunities to express what kind of inter-professional cooperation they would appreciate in the future and how they would like to improve oral health care for asthma patients.

Even though ideas from nurses were varying, their aim was the same: better oral health for their asthma patients. Different suggestions were mentioned; cooperation between nurses and dental hygienists, group sessions for asthma patients with dental nurses, workshops or lectures for asthmatics, where patients could potentially find a peer, etc. Nurses themselves would be interested in cooperation with dental health care professionals while dealing with asthmatics oral health- related issues. According to their opinions, future dental health care students could organize events for them or for the patients, where they could have presentations and provide also written materials on the connection between asthma and oral health.

## 6.5 Previous Studies

Tanja-Lotta Jokiaho & Linda Rantala have done a similar study in their bachelor thesis at the Oulu University of Applied Sciences in 2011, "Oral Health Care as Part of Asthmatic Children's Counseling." In their case five general nurses working for Oulu University hospital were chosen as the subject of the study. All the interviewed nurses have had previous experience in guiding children with asthma disease. The research was qualitative, and semi-structured interview was chosen as the method for collecting research data. The aim of their research was to describe what kind of oral health- related instructions general nurses provide for children suffering from asthma. (Jokiaho & Rantala 2011, 19, 21-23.)

The goal of their first research question was to show what kind of guidance general nurses provide to children with asthma. Nurses' guidance at their offices included correct technique of drug taking, where the most important part was to teach patients in what order it is important to take drugs and implement home oral care. The guidance for asthmatics children also included advice on home oral care, oral health care specialists and side effects of asthma medications.

In the second research question researchers wanted to show what kind of knowledge nurses have about the influence and side effect of asthma drugs on oral health. The main point was to show what the nurses know about connection between asthma medication and its influence on incidence of tooth decay, support tissue diseases, soft tissues diseases and lower salivary rate. It appeared that nurses have good knowledge about connection between wrong drugs dosing technique and oral hygiene and tooth decay appearance. They were also able to explain that gingivitis or periodontitis is caused when there are some drugs left in oral cavity, especially cortisone. In the study it appeared that nurses do not have enough knowledge on the fact that salivary rate of asthmatic patients is lower, regardless of whether the patient is an adult or child.

In the third research question nurses were asked to evaluate their own skills on guiding children asthma patients in oral health care related topics, as well as to express their need in additional training and development. Nurses pointed out that their knowledge about the topic is on a basic level and unfortunately they are missing regular updates

and refresher/follow-up results from newest researches. They expressed that there are not enough courses on the topic and usually they have to search for information about asthma-oral health related topics on their own by reading professional articles. Interviewed nurses are hoping for more training from where they could receive more information and knowledge on the topic of asthma - oral health.

According to the study nurses have very good knowledge on how to use asthma medications and how to guide their child patients. Knowledge about asthma drugs- oral health relations needs to be improved among nurses. Nurses should be aware about side effects of asthma drugs on oral health of children suffering of asthma. Researchers hope their conclusions could help when multiprofessional cooperation between nurses and oral health care professionals is being developed in the future. (Jokiaho & Rantala 2011, 3, 41.)

## **6.6 Summary**

This study was carried out on the basis of semi-structured interview, and even with a small number of interview sources, the study shows that there is still room for improvement and development in the public health nurses guidance skills to asthma patients. During the process of analysis it appeared that nurses are missing information and knowledge about oral health- related topics while dealing with asthma patients, and also that there are insufficient resources (human and/or financial) to provide and organize additional trainings for nurses regarding to the topic.

In this study (as well as in previous similar study made by Jokiaho & Rantala in 2011) it arises that during nurses' professional studies, only limited and usually insufficient amount of information regarding oral health- related issues is provided. This is usually caused by limited resources or avoiding possible overlap of training.

The analysis also shows that public health nurses dealing with asthma patients would appreciate more multi-professional cooperation on any level with oral health care professionals or students. Individual or group sessions for both- patients and nurses were suggested as the inter-professional team-work possibility. This could help nurses

to improve their professional skills as well as help to improve the welfare of their patients.



## 7 CONCLUSION

The main aim of this study was to assess and ascertain the skill level of public health nurses in Finland when providing guidance on oral health care to asthma patients. The study also aimed to provide an insight into how public health nurses' professional guidance skills could possibly be improved and what, in the nurses' own opinions, still can and needs to be done in order to achieve this improvement.

Qualitative analysis was the approach chosen to achieve the above-mentioned aims. A structured questionnaire was developed basing on the relevant current theoretical and practical knowledge pertaining to asthma as a medical condition, as well as the medications prescribed to asthmatic patients and the possible and common side effects of these same medications within the oral cavity. The research questions were designed to elicit solid, factual answers pertaining to the aims of the study.

The questionnaire was then presented to public health nurses by means of a semi-structured interview, permitting the interviewees, all of whom are public health nurses currently employed by various health care centres in the city of Oulu, Finland, to also provide the study with other information that they considered as relevant and useful, even though it did not directly answer the research questions designed and presented.

For this study, a total of five public health nurses with varying work histories were interviewed, and their answers recorded and utilized for content analysis. All five interviewees volunteered to take part in this study, and were informed in advance that all results and information collected for the study will be done anonymously. The content analysis was carried out immediately after the completion of the interviewing process, and all collected data was destroyed and disposed of as per professional ethical standards.

The trustworthiness of the results collected from this study is guaranteed in part by the fact that all interviewees are professionals in their field, and all had several years of working experience to base their information on. In addition to this, the research

questions were designed basing on well-established theory and well selected criteria, and carefully phrased to elicit purely factual responses as opposed to opinions. Where the interviewees were given an opportunity to add information they felt was relevant, even though it did not directly pertain to one of the research questions, they did so from a professional rather than personal perspective.

The results of the study showed that whereas all public health nurses have degrees in their own field, and that their knowledge on asthma-related medical conditions overall was quite good, the nurses rated their understanding of the side effects of asthma medication on patients' oral health as basic. The study revealed that the amount of information public health nurses receive during their professional studies on the connection between asthma and oral health is minimal. It also revealed that there are very few additional courses/trainings available to public health nurses to supplement their current knowledge, or then not enough room for all who wish to attend when there is such a course made available.

The subjects of the study clearly expressed a need and desire for more and better opportunities to improve and update their skills and knowledge relating to providing oral health care guidance to patients taking asthma medication. The two main suggestions were to increase the number and availability of supplementary courses/trainings available to nurses addressing this issue, as well as to provide a possibility for multi-professional cooperation. Multi-professional cooperation would give public health nurses the opportunity to acquire more knowledge and skills from specialists in the area, as well as the ability to provide a referral to the patient as and when necessary.

The results of this study could be utilized as a building block to improve multi-professional cooperation between public health nurses and other specialists relevant to the issue of dealing with oral health care guidance in asthmatic patients, such as dental health care professionals and students. They could also be used to prepare a guidebook on oral health care in asthmatic patients, for public health nurses and patients alike. As a follow-up to this study, it would be interesting and useful to research on how best to instigate and build multi-professional cooperation between public health nurses and dental health care professionals in order to achieve an efficient flow of accurate, timely

and relevant information, and therefore improve the oral health care guidance for asthma patients.

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# APPENDIX

## APPENDIX 1

### A Complete Listing of the Study Program for Public Health Nurses for the Academic Year 2013 – 2014

				Total
1. year	Basic and Professional Studies 35 ECTS cr	Free-choice Studies 5 ECTS cr	Practical Training 20 ECTS cr	60 ECTS cr
2. year	Basic and Professional Studies 35 ECTS cr	Free-choice Studies 10 ECTS cr	Practical Training 25 ECTS cr	60 ECTS cr
3. year	Basic and Professional Studies 30 ECTS cr	Bachelor's Thesis 5 ECTS cr	Practical Training 25 ECTS cr	60 ECTS cr
4. year	Basic and Professional Studies 25 ECTS cr	Bachelor's Thesis 10 ECTS cr	Practical Training 20 ECTS cr	60 ECTS cr
				<b>240 ECTS cr</b>

A = 1. period, B = 2. period, C = 3. period, D = 4. period. E.g. A2B1 in the table means that from a course of 3 credits 2 cr will be offered during the 1. period and 1 cr during the 2. period.

#### **+ BASIC AND PROFESSIONAL STUDIES 125**

The aim of basic studies is to provide the student with a comprehensive overall view of the position and significance of the field concerned within society and working life and in an international perspective, to familiarise the student with the general theoretical basis of the field and with communications, and to provide the student with the sufficient language proficiency necessary for practising the profession and for further professional development (A 352/2003).

The aim of professional studies is to familiarise the student with the main problems and applications in the professional field concerned and their scientific or artistic basis in order to allow the student to work independently in the field in either expert duties or development work, or as entrepreneur (A 352/2003).

STUDY YEAR	1	2	3	4	5	Tot. cr /
TERM	1	2	3	4	5	ECTS cr

#### **STUDY AND COMMUNICATION STUDIES 12**

O2211ST	Student at University of Applied Sciences and in Information Society	3						3
O0002ST	Finnish Language and Communication	3						3
O0032ST	English Language and Communication Skills	3						3
O0031ST	Swedish Language and Communication	3						3

#### **RESEARCH, DEVELOPMENT AND MANAGEMENT STUDIES 12**

O0020ST	Methods of Research and Development Work		6					6
O0051ST	Basics of Leadership and Entrepreneurship		6					6

**BASIC STUDIES IN SOCIAL AND HEALTH CARE****24**

O4488HO	Public Health and Interprofessional Work	3					3
O4028HO	Basics of Health Promotion	3					3
O0010ST	Developmental Psychology	3					3
O0024ST	Basics of Human Anatomy and Physiology	5					5
O0025ST	Basics of Microbiology and Infection Control	3					3
O0026ST	Pathology, Pathophysiology and Clinical Physiology		4				4
O4999HO	Evaluation and Treatment of Emergency Patient		3				3

**BASIC STUDIES IN GENERAL NURSING****36**

O4001HO	Ethics in Nursing and Nursing Science	3					3
O4002HO	Basics of Nursing	5					5
O4009HO	Pharmacology and Medication	6					6
O4004HO	Clinical Nursing	6					6
O4005HO	Nursing in Mental Health and Substance Abuse			4			4
O4008HO	Basics of Elderly Care			4			4
O4006HO	Family Nursing			4			4
O4007HO	Adult Nursing and Health Care			4			4

**ADVANCED STUDIES IN GENERAL NURSING****3****Optional Studies****3**

O1450ST	Nutrition and Health	3					3
O4022HO	Methods and Models in Health Promotion	3					3
O0104ST	Basics of Rehabilitation		3				3
O4040HO	Nursing in Patients' Eye, Ear, Nose, Throat and Skin Disorders	3					3
O1023ST	Crisis Psychology	3					3
O4804KÄ	Early Relationship and Breastfeeding Counselling	3	3				3
O4041HO	Nursing of a Child Needing Special Support		3				3
O4044HO	Violence in Nursing Environment	3					3
O4018HO	Basics of Sexual Health 1			3			3
O4019HO	Basics of Sexual Health 2			3			3
O4020HO	Basics of Sexual Health 3			3			3

**STUDIES IN PUBLIC HEALTH NURSING****26**

O4720TH	Public Health Care	3					3
O4705TH	Health Care During Pregnancy and Childhood			4			4
O4715TH	Working Methods of Public Health Nursing Sects			4	1		5
O4707TH	School and Student Health care				3		3
O4709TH	Public Health Nursing of the Working-age Population				3		3
O4711TH	Public Health Nursing of the Elderly				3		3
O4714TH	Development of Public Health Nursing				3	2	5

**MEDICAL SKILLS IN NURSING****12**

O4051HO	Major Public Health Problems	3							3
O4052HO	Medical Studies I		1	2					3
O4053HO	Medical Studies II				3				3
O4702TH	Preventive Medicine 3 op				1	2			3

**Studies Abroad**

Studies abroad can be recognised to the basic and professional studies according to the personal study plan.

**+ PRACTICAL TRAINING****85**

The aim of practical training is to familiarize students with practical duties of major importance in relation to their professional studies, in particular, and with the application of knowledge and skills in working life under supervised conditions (A 352/2003). Practical training period or some parts of it may be attained also abroad.

**STUDY YEAR**

**1 2 3 4 5**  
**1 2 3 4 5 6 7 8 9**  
 Tot. or /  
 ECTS or

**TERM****PRACTICAL TRAINING IN BASICS OF GENERAL NURSING****55**

O2051EH	Clinical Training in Basics of Nursing I	7							7
O4073HO	Practical Training in Clinical Nursing Skills III		6						6
O4074HO	Practical Training in Clinical Nursing Skills IV		6						6
O4014HO	Clinical Training in Elderly Nursing			7					7
O4027HO	Clinical Training in Mental Health and Substance Abuse Nursing			7					7
O4013HO	Clinical Training in Adult Nursing and Health Care			6					6
O4033HO	Practical Training in Family Nursing I			6					6
O4030HO	Practical Training in Family Nursing II			6					6
O4031HO	Practical Training in Family Nursing III			4					4

**PUBLIC HEALTH NURSING, PRACTICAL TRAINING**
**30**

O4721TH	Practical Training in Public Health Care	3							3
O4716TH	Practical Training in Maternity and Child Health Clinics				12				12
O4718TH	Practical Training in School and Student Health Care				12				6
O4717TH	Public Health Nursing Practice with the Working-age Population				12				6
O4713TH	Practice of Leadership and Management in Public Health Nursing				3				3

**+ BACHELOR'S THESIS 15**

The aim of the Bachelor's thesis is to enhance and demonstrate the ability of students to apply their knowledge and skills in practical expert duties related to their professional studies (A 352/2003).

STUDY YEAR		1	2	3	4	5	Tot. cr / ECTS cr
TERM		1	2	3	4	5	
O0111ST	Theoretical Basis for Bachelor's Thesis		4				4
O0101ST	Planning of Research/Project			3			3
O0102ST	Bachelor's Thesis and Maturity Test			3	1	4	8

**+ FREE-CHOICE STUDIES 15**

STUDY YEAR		1	2	3	4	5	Tot. cr / ECTS cr
TERM		1	2	3	4	5	
Y00044F	Demola Project						3
O0050ST	Learning Interprofessionally						3
O0083ST	Project training						5
O0084ST	Project Management Training						5
O0080ST	Work Experience in Health and Social Care I						3
O0081ST	Work Experience in Health and Social Care II						3
O0082ST	Work Experience in Health and Social Care III						3
O0039ST	International Competences in Health and Social Care						3
Y00033F	Incubation for Business Ideas						9
O0052ST	Groupwork in Preventive Health and Wellbeing						5
O1002ST	First Aid						3
O4046ST	Health Behaviour Against HIV/AIDS						3
O1000ST	Sustainable Development in Social and Health Care						3
O0037ST	Extension and Advancement of the Professional Skills						3

### Preparation to International Exchange

3

Compulsory for students who are taking part in student exchange.

Y00021E	Orientation to Student Exchange							3
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## Studies Abroad

Studies abroad can be recognised to the free-choice studies according to the personal study plan.

<b>+ STUDIES TOTAL</b>	<b>240</b>
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STUDY YEAR	1		2		3		4		5		Tot. cr / ECTS cr
TERM	1	2	3	4	5	6	7	8	9		

## The Frame of the Interview (in English Language)

### **General information:**

- What is your basic (professional) education?
- Do you have some specialization? / Are you specialized in working with some certain group of patients or some age-range?
- Have you attended some additional asthma or allergy training?
- For how long have you been working as a public health nurse in health care centre?
- How big a part of your working time do you spend with asthma patients/clients?

### **What is the knowledge of public health nurse about influence of asthma drugs on oral health of asthma patient?**

- What are the general side-effects of asthma drugs?
- In your opinion, how do asthma drugs affect oral health?
- In your opinion, what kind of connection is there between asthma drugs and tooth decay?
- In your opinion, what is the connection between asthma drugs and periodontal diseases, such as for example gingivitis?

### **What does the public health nurse take into account while giving guidance about oral health for asthmatics?**

- What kind of oral health-related guidance do you provide to asthma patients at your office?
- How do you check oral health of asthma patients at you office?
- Do your asthma patients ask about oral health care related problems? What kind of oral health care related topics do you usually discuss with your asthma patients?

### **What kind of information/knowledge do public health nurses have regarding oral health care guidance for asthma patients?**

- What kind of oral health-related information did you get during your professional studies as a public health nurse?



- What kind of oral health-related courses and workshops are available for public health nurses? In your opinion, what kind of courses are required?

**How could public health nurses develop/improve oral health care for asthma patients?**

- What kind of inter-professional cooperation would you like with other oral health care professionals?
- How would you improve oral health care for asthma patients?

## The Frame of the Interview (in Finnish Language)

**Perustiedot**

- Mikä on ammatillinen peruskoulutuksesi?
- Oletko suorittanut alaasi liittyviä erikoistumisopintoja? Mitä?
- Oletko osallistunut astmaan tai allergiaan liittyvään koulutukseen?
- Kuinka kauan olet työskennellyt terveydenhoitajana terveyskeskuksessa?
- Kuinka suuren osan työajastasi käytät astmapotilaiden kanssa?

**Millaista tietoa terveydenhoitajilla on astmalääkkeiden vaikutuksesta astmapotilaiden suunterveyteen?**

- Minkälaiset astmalääkkeiden yleiset sivuvaikutukset ovat?
- Miten astmalääkkeet mielestäsi vaikuttavat suunterveyteen?
- Millainen yhteys astmalääkkeillä ja hampaiden reikiintymisellä mielestäsi on?
- Millainen yhteys mielestäsi on astmalääkkeillä ja hampaiden tukikudossairauksilla, kuten ientulehduksella?

**Mitä terveydenhoitaja ottaa huomioon neuvoessaan astmapotilaita suunterveydessä?**

- Miten ohjaat astmapotilaita suun terveyteen liittyvissä asioissa?
- Miten arvioit astmapotilaiden suunterveyden?
- Kysyvätkö astmapotilaasi suunterveyteen liittyvistä ongelmista? Mistä suun terveyteen liittyvistä asioista yleensä keskustellaan?

**Millaiset tiedot terveydenhoitajilla on astmapotilaan suun terveydenhoidon ohjauksesta?**

- Minkälaista suunterveyteen liittyvää tietoa olet saanut terveydenhoitajan opinnoissasi?
- Millaisia suunterveyteen liittyviä opintoja/opintopäiviä on terveydenhoitajille? Minkälaista koulutusta olisi mielestäsi hyvää järjestää?

**Miten terveydenhoitajat kehittäisivät astmapotilaiden suunterveydenhoitoa?**

- Minkälaisia keinoja käyttäisit?
- Minkälaista yhteistyötä haluaisit tehdä suunterveyden ammattilaisten kanssa?

Request for Interview (In English Language)

Hello!

I am a dental hygiene student at Oulu University of Applied Sciences. I am writing my thesis on the subject: "A Look at the Oral Health Guidance Skills of Public Health Nurses Working with Asthma Patients". The goal of this study thesis is to provide an overview of the oral health guidance provided to asthma patients by public health nurses. It is also my goal to research the skills and knowledge of public health nurses regarding the effects of asthma medications on oral health. The skills and abilities of public health nurses in providing information and guidance related to oral health care to asthma patients will also be assessed. The aim of this work is to demonstrate how and to what degree public health nurses participate in oral health care guidance for asthma patients.

I hope that this research proposal attracts your interest, and that you would be willing to take part as a valued professional in the field. Participation is voluntary. Personal information will not be divulged under any circumstances. The interviews will be recorded and all resulting material destroyed on completion of the research project. Confidentiality will be kept at all times.

If you are interested and would like to take part in this research project, kindly contact me by email or phone so that we can arrange for an interview. I will be happy to answer any questions you may have regarding this research project.

Best Regards,

Veronika Fedorik

## Request for Interview (In Finnish Language)

Hei!

Olen Oulun ammattikorkeakoulun suuhygienistiopiskelija. Teen opinnäytetyötä aiheesta: "Terveystenhoitaja astmapotilaan suun terveyden edistämässä". Tämän opinnäytetyön tarkoituksena on kuvata, millaisia suun terveyteen liittyviä ohjeita terveydenhoitajat antavat astmapotilaille. Tarkoituksena on myös selvittää, mitä ja kuinka paljon terveydenhoitajat tietävät astmalääkkeiden vaikutuksista suun terveyteen. Tutkimuksessa tarkastellaan myös terveydenhoitajien kykyä tarjota astmapotilaille tietoa ja opastusta suun terveyteen liittyvissä asioissa. Tutkimuksen tavoitteena on tuoda esille terveydenhoitajien osaaminen astmapotilaiden suun terveydenhuollon ohjaamisessa.

Toivon, että mielenkiintonne heräsi ja haluaisitte osallistua tutkimukseeni, sillä juuri teillä on aiheesta arvokasta tietoa. Osallistuminen on vapaaehtoista ja osallistuneiden henkilöllisyys ei paljastu missään vaiheessa. Haastattelut nauhoitetaan ja materiaali tuhoetaan tutkimuksen valmistuttua. Noudatetaan vaitiolovelvollisuutta.

Jos kiinnostuitte ja haluatte olla mukana opinnäytetyössäni, niin ottakaa minuun yhteyttä joko sähköpostitse tai puhelimitse, jotta voimme sopia haastatteluaian. Vastaan mielelläni tutkimukseen liittyviin kysymyksiin.

Ystävällisin terveisin,

Veronika Fedorik

## Consent Form for Participants in Research Project/Thesis (In English Language)

Hello!

I request for your permission to interview you and utilize the resulting material in my school thesis. I am a dental hygiene student at Oulu University of Applied Sciences. I am writing my thesis on the subject: "A Look at the Oral Health Guidance Skills of Public Health Nurses Working with Asthma Patients". The goal of this study thesis is to provide an overview of the oral health guidance provided to asthma patients by public health nurses. It is also my goal to research the skills and knowledge of public health nurses regarding the effects of asthma medications on oral health. The skills and abilities of public health nurses in providing information and guidance related to oral health care to asthma patients will also be assessed. The aim of this work is to demonstrate how and to what degree public health nurses participate in oral health care guidance for asthma patients.

Participation is voluntary. Personal information will not be divulged under any circumstances. The interviews will be recorded and all resulting material destroyed on completion of the research project. Confidentiality will be kept at all times.

There are two copies of this consent form, one each for both sides.

Thank you for your participation!

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Date and Place

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Interviewer Veronika Fedorik

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Interviewee signature

## Consent Form for Participants in Research Project/Thesis (In Finnish Language)

Hei!

Pyydän Teiltä lupaa haastatteluun, sekä haastatteluaineiston käyttämiseen opinnäytetyötäni varten. Olen Oulun ammattikorkeakoulun suuhygienistiopiskelija. Teen opinnäytetöitä aiheesta "Terveystenhoitaja astmapotilaan suun terveyden edistämässä". Tämän opinnäytetyön tarkoituksena on kuvata, millaisia suun terveyteen liittyviä ohjeita terveydenhoitajat antavat astmapotilaille. Tarkoituksena on myös selvittää, mitä ja kuinka paljon terveydenhoitajat tietävät astmalääkkeiden vaikutuksista suun terveyteen. Tutkimuksessa tarkastellaan myös terveydenhoitajien kykyä tarjota astmapotilaille tietoa ja opastusta suun terveyteen liittyvissä asioissa. Tutkimuksen tavoitteena on tuoda esille terveydenhoitajien osaaminen astmapotilaiden suun terveydenhuollon ohjaamisessa.

Tutkimuksemme osallistuminen on vapaaehtoista ja osallistuneiden henkilöllisyys ei paljastu missään vaiheessa. Haastattelut nauhoitetaan ja materiaali tuhoetaan tutkimuksen valmistuttua. Noudatetaan vaitiolovelvollisuutta.

Näitä suostumuslomakkeita kirjoitetaan kaksi kappaletta, molemmille osapuolille yksi kappale.

Kiitos osallistumisestasi!

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Paikka ja aika

\_\_\_\_\_  
Haastattelija Veronika Fedorik

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Haastateltavan allekirjoitus